Claims

1. A light-emitting device characterized by comprising:

a cathode;

an anode that constitutes a pair together with the cathode;

a hole injecting layer that comes into contact with the anode and disposed between the anode and the cathode; and

a luminescent layer that is disposed between the hole injecting layer and the cathode and emits light when an electric field is applied,

wherein the hole injecting layer is made of a conjugate polymer that is soluble in an organic solvent and has been oxidized by an electron-accepting organic compound; and

wherein a fundamental skeleton of the conjugate polymer is polythiophene, polyaniline, polypyrrole or polyfuran.

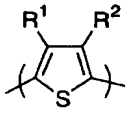
2. The light-emitting device according to claim 1, characterized in that the light-emitting element includes a hole transporting layer disposed so as to come into contact with the hole injecting layer.

3. The light-emitting device according to claim 1, characterized in that the light-emitting element includes a hole transporting layer disposed so as to come into contact with the hole injecting layer and a luminescent layer disposed so as to come into contact with the hole transporting layer.

4. The light-emitting device according to claim 1, characterized in that the light-emitting element includes a hole transporting layer disposed so as to come into contact with the hole injecting layer, the luminescent layer disposed so as to come into contact with the hole transporting layer, and an electron transporting layer disposed so as to come into contact with the luminescent layer.

5. The light-emitting device according to claim 1, characterized in that the light-emitting element includes a hole transporting layer disposed so as to come into contact with the hole injecting layer, the luminescent layer disposed so as to come into contact with the hole transporting layer, an electron transporting layer disposed so as to come into contact with the luminescent layer, and an electron injecting layer disposed so as to come into contact with the electron transporting layer.

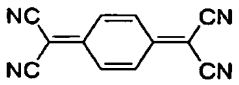
6. The light-emitting device according to claim 1, characterized in that as the conjugate polymer that has polythiophene as a fundamental skeleton a polymer expressed by the formula (1) is used.



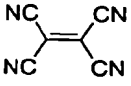
(1)

(In the formula, R^1 and R^2 are the same or different from each other and represent an organic residue that may contain a hydrogen atom, a halogen atom, an oxygen atom, a sulfur atom or a nitrogen atom.)

7. The light-emitting device according to claim 1, characterized in that the electron-accepting organic compound is at least one kind of compounds expressed by the formulas (2) through (9).



(2)



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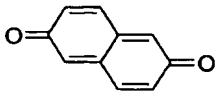

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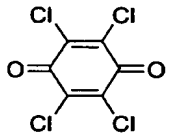

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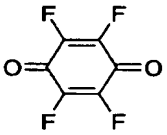

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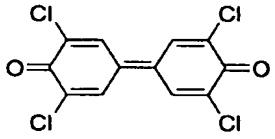

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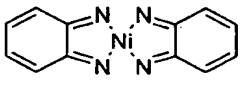

(9)

8. The light-emitting device according to claim 2, characterized in that a blocking material having an energy difference between a highest occupied molecular orbit and a lowest unoccupied molecular orbit larger than that of a hole transporting material contained in the hole transporting layer is contained in a region between the hole transporting layer and the cathode.

9. The light-emitting device according to claim 3, characterized in that a blocking material having an energy difference between a highest occupied molecular orbit and a lowest unoccupied molecular orbit larger than that of a hole transporting material contained in the hole transporting layer is contained in a region between the

hole transporting layer and the cathode.

10. The light-emitting device according to claim 4, characterized in that a blocking material having an energy difference between a highest occupied molecular orbit and a lowest vacant molecular orbit larger than that of a hole transporting material contained in the hole transporting layer is contained in a region between the hole transporting layer and the cathode.

11. The light-emitting device according to claim 5, characterized in that a blocking material having an energy difference between a highest occupied molecular orbit and a lowest vacant molecular orbit larger than that of a hole transporting material contained in the hole transporting layer is contained in a region between the hole transporting layer and the cathode.

12. The light-emitting device according to claim 1, characterized in that the light-emitting element includes a compound that exhibits emission from a triplet-excitation state.

13. The light-emitting device according to claim 1, characterized in that the conjugate polymer is electrochemically oxidized.

14. The light-emitting device according to claim 1, characterized in that the conjugate polymer is formed in film owing to electric field polymerization of corresponding monomers.

15. An electric appliance characterized by comprising a light-emitting device according to claim 1.

16. A method of preparing a light-emitting device, characterized by comprising:

preparing a conjugate polymer having a substitution group that has polythiophene, polyaniline, polypyrrole or polyfuran as a fundamental skeleton and

imparts the solubility to an organic solvent;

doping an electron-accepting organic compound to the conjugate polymer; and

depositing the conjugate polymer on an anode to form a hole injecting layer.

17. A method of preparing a light-emitting device, characterized by comprising:

preparing a conjugate polymer having a substitution group that has polythiophene, polyaniline, polypyrrole or polyfuran as a fundamental skeleton and imparts the solubility to an organic solvent;

electrically oxidizing the conjugate polymer; and

depositing the conjugate polymer on an anode to form a hole injecting layer.

18. The method of preparing a light-emitting device according to claim 16, characterized in that the conjugate polymer has an electron-releasing substitution group instead of having the substitution group that imparts the solubility to an organic solvent.

19. The method of preparing a light-emitting device according to claim 17, characterized in that the conjugate polymer has an electron-releasing substitution group instead of having the substitution group that imparts the solubility to an organic solvent.